		Job No 24590	
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<b>SUPPLIER DOCUMENT STATUS</b>			
1.	<input checked="" type="checkbox"/>	Work may proceed.	
2.	<input type="checkbox"/>	Revise and resubmit. Work may proceed subject to resolution of indicated comments.	
3.	<input type="checkbox"/>	Revise and resubmit. Work may not proceed.	
4.	<input type="checkbox"/>	Review not required. Work may proceed.	
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.			
REVIEWED			
G-321 Document Category <u>N/A</u> [From Supplement A to G-321-E (E) or G-321-V (V), as applicable, or "N/A" if SSRS is used]			
Supersedes BNI Document No. <u>N/A</u> [When applicable]		Rev. _____	
Accepted by	<u>[Signature]</u> Print Name	Signature	<u>[Signature]</u> Date 4/1/04
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24590-CM-HC4-HXYG-00138-02-00023  
REV. 00A

~~PURCHASE ORDER~~ <sup>0841-04</sup> SUBMITTAL  
SUBCONTRACT

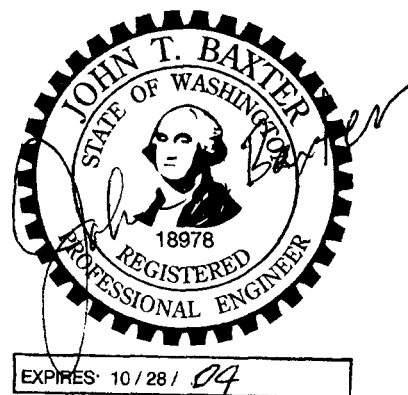
**IQRPE REVIEW -  
PRETREATMENT FACILITY (PTF) TREATED LAW EVAPORATION  
PROCESS (TLP) SYSTEM MISCELLANEOUS TREATMENT UNITS AND  
VESSELS**

"I, John T. Baxter have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Miscellaneous Treatment Units and Vessels as required by The Dangerous Waste Regulations, namely, WAC 173-303-640(3) applicable paragraphs, i.e., (a) through (g)."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicate that the design intent fully satisfies the requirements of the WAC.

The attached review is eleven (11) pages numbered one (1) through eleven (11).



Signature John T. Baxter

04/01/2004  
Date

24590-CM-HC4-HX4G-00138-02-00023, REV. 004

**STRUCTURAL INTEGRITY ASSESSMENT OF THE  
PRETREATMENT FACILITY (PTF) TREATED LAW  
EVAPORATION PROCESS (TLP) SYSTEM  
MISCELLANEOUS TREATMENT UNITS AND  
VESSELS**

**COGEMA-IA-048  
Rev. 0**

**Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.**

<p><b>Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System</b></p> <p><b>Miscellaneous Treatment Units and Vessels</b></p>	<p>COGEMA-IA-048, Rev. 0</p>
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<p><b>Scope</b></p>	<p>Scope of this Integrity Assessment</p>	<p>The scope of this integrity assessment includes the Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Miscellaneous Treatment Units (MTUs) and Vessels. The MTUs include: Treated LAW Evaporator Reboiler, TLP-RBLR-00001 and Treated LAW Evaporator Separator Vessel, TLP-SEP-00001. These MTUs are being purchased as part of a Material Requisition for vendor packaged process units titled "Evaporators (Forced Recirculation)". The Vessels are LAW SBS Condensate Receipt Vessels, TLP-VSL-00009A &amp; TLP-VSL-00009B and Treated LAW Evaporator Condensate Vessel, TLP-VSL-00002. The primary function of the TLP System MTUs and vessels is to increase the concentration of Treated Low Activity Waste (LAW) feed prior to transfer to the LAW vitrification facility for glassification.</p>
<p><b>References</b></p>	<p>Material Requisition No. 24590-CM-MRB-MVA0-00001, Rev. 1, Pressure Vessels, Shop Fabricated Large (VXNW), MR Section 2 – Technical Specifications (Rev. 3, January 6, 2003);  Material Requisition No. 24590-QL-MRA-MEVV-00001, Rev. 2, Evaporators (Forced Recirculation) QL-1, MR Section 2 – Technical Specifications (Rev. 0, May 2002);  Material Requisition Supplement 24590-QL-MRA-MEVV-00001-S01 to MR No. 24590-QL-MRA-MEVV-00001, Rev. 2;  24590-PTF-P1-P01T-P0001, Rev. 3, Pretreatment General Arrangement Plan at EL. 0'-0";  24590-PTF-M5-V17T-P0005, Rev. 0, Process Flow Diagram Treated LAW Evaporation System TLP;  24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System;  24590-PTF-3YD-TLP-00001, Rev. 0, System Description for Treated LAW Evaporation Process (TLP);  System Description Change Notice (SDCN) No. 24590-PTF-3YN-TLP-00001 for System Description Number 24590-PTF-3YD-TLP-00001, Rev. 0;</p>	

<b>Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System</b> <b>Miscellaneous Treatment Units and Vessels</b>	COGEMA-IA-048, Rev. 0
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<b>References</b>  Drawings, Mechanical Data Sheets and Material Selection Data Sheets	24590-PTF-MV-TLP-00001, Rev. 0, Equipment Assembly LAW SBS Condensate Receipt Vessel TLP-VSL-00009A; 24590-PTF-MV-TLP-00002, Rev. 0, Equipment Assembly LAW SBS Condensate Receipt Vessel TLP-VSL-00009B; Mechanical Data Sheet Shell and Tube Heat Exchanger 24590-PTF-MED-TLP-00004, Treated LAW Evaporator Reboiler TLP-RBLR-00001; Mechanical Data Sheet: Vessel 24590-PTF-MVD-TLP-00005, Rev. 0, Treated LAW Evaporator Separator Vessel TLP-SEP-00001; Mechanical Data Sheet: Vessel 24590-PTF-MVD-TLP-00004, Rev. 0, Treated LAW Evaporator Condensate Vessel TLP-VSL-00002; Mechanical Data Sheet: Vessel 24590-PTF-MVD-TLP-00001, Rev. 0, LAW SBS Condensate Receipt Vessel TLP-VSL-00009A; Mechanical Data Sheet: Vessel 24590-PTF-MVD-TLP-00002, Rev. 0, LAW SBS Condensate Receipt Vessel TLP-VSL-00009B; Vessel/Tank Material Selection Data Sheet, 24590-PTF-NID-TLP-P0006, Rev. 0, Treated LAW Evaporator Condensate Vessel TLP-VSL-00002 (PTF); Vessel/Tank Material Selection Data Sheet, 24590-PTF-NID-TLP-P0001, Rev. 0, LAW SBS Condensate Receipt Vessels TLP-VSL-00009A&B (PTF); Plant Item Material Selection Data Sheet 24590-PTF-NID-TLP-P0005, Rev. 0, Treated LAW Evaporator Separator Vessel TLP-SEP-00001 (PTF); Plant Item Material Selection Data Sheet 24590-PTF-NID-TLP-P0011, Rev. 0, Treated LAW Evaporator Reboiler TLP-RBLR-00001 (PTF)
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**Summary of Assessment**

For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design controls and requirements to assure the design intent fully satisfies the WAC requirements.

Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Miscellaneous Treatment Units TLP-RBLR-00001 and TLP-SEP-00001		COGEMA-IA-048, Rev. 0
Information Assessed	Source of Information	Discussion

<p><b>Design</b></p> <p>Plant item design standards are appropriate and adequate for the plant item's intended use.</p>	<p>Data Sheets for the MTUs listed above under References; 24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System; Specification Change Notice (SCN) No. 24590-PTF-3PN-MEVV-00001 for Specification No. 24590-PTF-3PS-MEVV-T00001, Rev. 0; 24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication; 24590-WTP-3PS-MES0-T0001, Rev. 0, Engineering Specification for Shell and Tube Heat Exchangers; ASME Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers</p>	<p>The Engineering Specification for Forced Circulation Vacuum Evaporator System specifies that MTU TLP-SEP-00001 is to be designed in accordance with the Engineering Specification for Pressure Vessel Design and Fabrication which requires that the MTU and all MTU appurtenances are to be designed to ASME Section VIII, Division 1 rules. The reboiler (TLP-RBLR-00001) is to be designed to these same requirements supplemented by the requirements specified in the Engineering Specification for Shell and Tube Heat Exchangers. These design requirements are appropriate for these MTUs operating over the pressure and temperature ranges specified on the Data Sheets. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication and the Specification for Shell and Tube Heat Exchangers.. These supplementary requirements address pressure vessel fatigue analysis, positive material identification, standard fabrication tolerances, acceptable welding procedures for the MTUs and appurtenances, welder qualifications and testing records, NDE inspections and records, quality assurance requirements, and packaging, shipping, handling and storage requirements. The general arrangement sketches for the TLP System MTUs and performance requirements are presented in the Engineering Specification for Forced Circulation Evaporator System. The SCN identifies that TLP-RBLR-00001 and TLP-SEP-00001 are upgraded to Quality Level (QL-1) and Seismic Category (SC-I) to improve their reliability. These are adequate and acceptable codes and standards for these MTUs.</p>
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Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Miscellaneous Treatment Units TLP-RBLR-00001 and TLP-SEP-00001			COGEMA-IA-048, Rev. 0
Information Assessed	Source of Information	Discussion	

Design	If a non-standard plant item is to be used, the design calculations demonstrate sound engineering principles of construction.	24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System; 24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication; 24590-WTP-3PS-MES0-T0001, Rev. 0, Engineering Specification for Shell and Tube Heat Exchangers	The Engineering Specification for Forced Circulation Vacuum Evaporator System requires that the ASME Section VIII, Division 1 MTUs be delivered after design, fabrication, inspection and testing with an ASME U stamp and that the MTUs be registered with the National Board. They are shop fabricated MTUs for mixed waste service in the Pretreatment Facility. As discussed in the item immediately above, the MTU design standards are appropriate and adequate for the MTUs' intended uses.
	Plant item has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Data Sheets for the MTUs listed above under References; 24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication; 24590-WTP-3PS-MV00-T0002, Rev. 1, Engineering Specification for Seismic Qualification Criteria for Pressure Vessels; 24590-WTP-3PS-SS90-T0001, Rev. 0, Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks; ASME Section VIII, Division 2, Alternative Rules, American Society of Mechanical Engineers	The Engineering Specification for Pressure Vessel Design and Fabrication requires consideration of the operating pressures, temperatures, seismic loads, and corrosion allowance in the design process for the MTUs. Supplementary seismic design criteria from ASME Section VIII, Division 2 are specified in the Engineering Specification for Seismic Qualification Criteria for Pressure Vessels to provide for the MTUs seismic design analysis. The Mechanical Data Sheets identify each MTU's operating pressure and temperature ranges, the materials selected for each MTU, the corrosion allowance selected for each MTU, the quality levels for each MTU, and the requirements for seismic design of each MTU. The Mechanical Data Sheets indicate that MTUs TLP-RBLR-00001 and TLP-SEP-00001 are Quality Level (QL-1) and are to be analyzed as Seismic Category (SC-I) equipment using the methodology detailed in the Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks. These are appropriate requirements and criteria to ensure the MTUs have adequate strength to withstand all loads at their end of service life.

**Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System  
Miscellaneous Treatment Units TLP-RBLR-00001 and TLP-SEP-00001**

COGEMA-IA-048, Rev. 0

Information Assessed	Source of Information	Discussion
<p><b>Foundation</b></p> <p>Plant item foundation will maintain the load of a full plant item.</p>	<p>Mechanical Data Sheets for the MTUs listed above under References; 24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System; 24590-WTP-3PS-MV00-TP001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication</p>	<p>The Engineering Specification for Forced Circulation Vacuum Evaporator System provides layout sketches for the MTUs and specifies use for the Engineering Specification for Pressure Vessel Design and Fabrication. Data Sheets for the MTUs show that the supports are to be 304 stainless steel (maximum 0.030% Carbon), dual certified, hereinafter referred to as 304L stainless steel. Support locations are shown in the layout sketches. The Engineering Specification for Pressure Vessel Design and Fabrication requirements provide for adequate MTU foundation designs.</p>
<p>If in an area subject to flooding, the plant item is anchored.</p>	<p>24590-WTP-3PS-MV00-TP001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication</p>	<p>Buoyant forces of an empty vessel in a flooded room are a standard design load case in the specification for Pressure Vessel Design and Fabrication. This load case will be applied in the design where applicable.</p>
<p>Plant item system will withstand the effects of frost heave.</p>	<p>24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System; 24590-WTP-DC-ST-01-001, Rev. 1, Structural Design Criteria</p>	<p>The TLP system layout sketches in the Engineering Specification for Forced Circulation Vacuum Evaporator System show that the MTUs are located in process cells and areas inside the PTF. The Structural Design Criteria requires that structural foundations extend into the surrounding soil below the frost line to preclude frost heave. The frost line is located 30" below finished grade. The PTF mat foundation is not subject to frost heave; therefore, the TLP MTUs will not be subject to frost heave.</p>
<p>Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)</p>	<p>Data Sheets and Process Flow Diagram listed above under References; 24590-WTP-PSAR-ESH-01-002-02, Rev. 1a, Preliminary Safety Analysis Report (PSAR) to Support Construction Authorization; PT Facility Specific Information; 24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System</p>	<p>The PSAR identifies the main function of the TLP system to be concentration of decontaminated treated LAW feed prior to transfer to the LAW vitrification facility for glassification. The process streams for the TLP evaporator system are listed in the Engineering Specification for Forced Circulation Vacuum Evaporator System. The primary safety function of the MTUs is to provide primary containment for the dangerous waste contents of the LAW feed. Each vessel is furnished with a grounding lug to control the discharge of static electricity. Both of these TLP MTUs use 304L stainless steel for the containment boundaries which is adequate for this service.</p>



Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Miscellaneous Treatment Units TLP-RBLR-00001 and TLP-SEP-00001			COGEMA-IA-048, Rev. 0
Information Assessed	Source of Information	Discussion	

Waste Characteristics	Plant item is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System	The TLP system operations are discussed in the Engineering Specification for Forced Circulation Vacuum Evaporator System. This document identifies that the MTUs will be used for concentration of LAW feed only. No additional chemical reagents will be added to the MTUs contents for processing during normal operations.
	The waste types are compatible with each other.	24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System	The input and output process streams for the TLP system are discussed in the Engineering Specification for Forced Circulation Vacuum Evaporator System in some detail. Wastes entering this system are compatible with each other during normal operations.
Corrosion Protection	Plant item material and protective coatings ensure the plant item structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)	24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System; Material Selection Data Sheets and Mechanical Data Sheets listed above under References	The Engineering Specification for Forced Circulation Vacuum Evaporator System provides descriptions of the TLP MTUs and their locations in the PTF hot cell, inaccessible process cells and process areas. This description includes the external environmental conditions in which the MTUs will operate. The MTUs have design service lives of 40 years because of limited access for maintenance. The Material Selection Data Sheets for these MTUs identify the chemical characteristics of the LAW feed, the expected operating temperatures, and the anticipated normal operations that will occur in the MTUs. Based on these parameters, 304L stainless steel was selected as an appropriate material choice with a recommended corrosion allowance of 0.04 in. for a 40 year service life for TLP-SEP-00001. No shell side corrosion allowance is specified for TLP-RBLR-00001. The TLP MTUs are adequately protected to provide the expected service life.

Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Miscellaneous Treatment Units TLP-RBLR-00001 and TLP-SEP-00001			COGEMA-IA-048, Rev. 0
Information Assessed	Source of Information	Discussion	

<b>Corrosion Allowance</b>	Corrosion allowance is adequate for the intended service life of the plant item.	Material Selection Data Sheets listed above under References	The Material Selection Data Sheets for these TLP system MTUs identify the chemical characteristics of the LAW feed, the expected operating temperatures, and the anticipated normal operations that will occur in the MTUs. Based on these parameters, 304L stainless steel was selected as an appropriate material choice with a recommended corrosion allowance of 0.04 in. for a 40 year service life for TLP-SEP-00001. The same material was selected for the shell of TLP-RBLR-00001, except that no shell side corrosion allowance is required. The material N06030 (Hastelloy G-30) was selected for the tubes of TLP-RBLR-00001 with a corrosion allowance of 0.040 inch on the waste side of the tubes. Hastelloy G-30 is a high nickel-chrome alloy with excellent corrosion resistance.
<b>Pressure Relief</b>	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the plant item are exceeded.	Process Flow Diagram listed above under References	The process flow diagram shows that TLP-RBLR-00001 and TLP-SEP-00001 overflow to TLP-VSL-00002. TLP-VSL-00002 is provided with an overflow outlet to PWD-VSL-00033 located at elevation (-) 45'-0" in the PTF.

**Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System  
Vessels TLP-VSL-00002 and TLP-VSL-00009A&B**

COGEMA-IA-048, Rev. 0

Information Assessed		Source of Information	Discussion
Design	Vessel design standards are appropriate and adequate for the vessel's intended use.	<p>Drawings, Material Requisitions and Mechanical Data Sheets listed above under References;</p> <p>24590-WTP-3PS-MV00-T0001, Rev. 0, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00009A&amp;B);</p> <p>24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00002);</p> <p>ASME Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers</p>	<p>The Material Requisitions require use of The Engineering Specification for Pressure Vessel Design and Fabrication for vessels TLP-VSL-00002 and TLP-VSL-00009A&amp;B. This specification requires that the vessels and all vessel appurtenances are to be designed to ASME Section VIII, Division 1 rules. Additional supplementary requirements are specified in the specifications for Pressure Vessel Design and Fabrication. These supplementary requirements address pressure vessel fatigue analysis, positive material identification, standard fabrication tolerances, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, quality assurance requirements, and packaging, shipping, handling and storage requirements. The Mechanical Data Sheets identify the TLP vessels as Quality Level (CM, Commercial Grade) and Seismic Category (SC-III) equipment. These are adequate and acceptable codes and standards for design and fabrication of these TLP system vessels.</p>
	If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.	<p>24590-WTP-3PS-MV00-T0001, Rev. 0, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00009A&amp;B);</p> <p>24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00002)</p>	<p>The Engineering Specifications for Pressure Vessel Design and Fabrication require that the TLP system vessels TLP-VSL-00002 and TLP-VSL-00009A&amp;B are to be designed and fabricated in accordance with the requirements of ASME Section VIII, Division 1. The vessels are to be delivered after design, fabrication, inspection and testing with an ASME code stamp and the vessels will be registered with the National Board. These are shop fabricated vessels for mixed waste service in the PTF. The vessel design standards are appropriate and adequate for the vessels' intended uses.</p>

COGEMA-IA-048, Rev. 0		
Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System Vessels TLP-VSL-00002 and TLP-VSL-00009A&B		
Information Assessed	Source of Information	Discussion
Design	<p>Drawings, Material Requisitions and Mechanical Data Sheets listed above under References; 24590-WTP-3PS-MV00-T0001, Rev. 0, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00009A&amp;B); 24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00002); 24590-WTP-3PS-MV00-T0002, Rev. 1, Engineering Specification for Seismic Qualification Criteria for Pressure Vessels; 24590-WTP-3PS-FB01-T0001, Rev. 1, Engineering Specification for Structural Design Loads for Seismic Category III &amp; IV Equipment and Tanks; UBC, 1997, Uniform Building Code, International Conference of Building Officials</p>	<p>The Engineering Specification for Pressure Vessel Design and Fabrication requires that the TLP vessels are to be designed to ASME Section VIII, Division 1 rules. This code requires specific consideration of the operating pressures, temperatures, seismic loads, and corrosion allowance in the design process. Supplementary design criteria are specified in the Engineering Specifications for Seismic Qualification Criteria and Structural Design Loads for Seismic Category III &amp; IV Equipment and Tanks to provide for the seismic design analysis. The Mechanical Data Sheets identify the operating pressure and temperature ranges for each vessel, the materials selected in the corrosion report, the corrosion allowance, and the requirements for seismic qualification in the design. The Mechanical Data Sheets indicate that vessels TLP-VSL-00002 and TLP-VSL-00009A&amp;B are to be analyzed as Seismic Category (SC-III) vessels which requires use of the seismic design requirements in the 1997 UBC. These are appropriate codes and criteria to ensure the tanks have adequate strength at the end of their design lives.</p>
Foundation	<p>Drawings listed above under References; 24590-PTF-3PS-MEVV-T0001, Rev. 0, Engineering Specification for Forced Circulation Vacuum Evaporator System; 24590-WTP-3PS-MV00-T0001, Rev. 0, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00009A&amp;B); 24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00002)</p>	<p>The Equipment Assembly drawings show the support arrangements for TLP-VSL-00009A&amp;B. The LAW SBS Condensate Receipt Vessels are provided with cylindrical skirts and a ring beam to provide for bearing on concrete and anchorage. Sketches in the Engineering Specification for Forced Circulation Vacuum Evaporator System show that TLP-VSL-00002 is supported on lug feet located at mid-height of the shell. These lug feet are supported on the evaporator skid structural steel frame which is also part of the vendor package. The Engineering Specifications for Pressure Vessel Design and Fabrication requirements assure adequate vessel foundation designs.</p>
	<p>24590-WTP-3PS-MV00-T0001, Rev. 0, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00009A&amp;B); 24590-WTP-3PS-MV00-T0001, Rev. 1, Engineering Specification for Pressure Vessel Design and Fabrication (TLP-VSL-00002)</p>	<p>Buoyant forces of an empty vessel in a flooded room are a mandatory standard design load case in the Engineering Specifications for Pressure Vessel Design and Fabrication.</p>

**Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System  
Vessels TLP-VSL-00002 and TLP-VSL-00009A&B**

COGEMA-IA-048, Rev. 0

Information Assessed		Source of Information	Discussion
Frost Heave	Vessel system will withstand the effects of frost heave.	Drawings and System Description listed above under References 24590-WTP-DC-ST-01-001, Rev. 0, Structural Design Criteria (TLP-VSL-00009A&B); 24590-WTP-DC-ST-01-001, Rev. 1, Structural Design Criteria (TLP-VSL-00002)	The PTF General Arrangement Plan at elevation 0'-0" shows that vessels TLP-VSL-00002 and TLP-VSL-00009A&B are installed in inaccessible process cells. These cells are supported by the PTF mat foundation. The Structural Design Criteria require that all structural foundations extend into the surrounding soil below the frost line in order to preclude frost heave. The frost line is located 30 in. below finished grade. The PTF mat foundation is not subject to frost heave; therefore, the TLP system vessels will not be subject to frost heave.
	Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)	Drawings, Mechanical Data Sheets and System Description listed above under References;	The System Description identifies that TLP-VSL-00009A & B receive primarily condensate from the LAW vitrification submerged bed scrubbers (SBSs) in the LAW primary offgas treatment system. This condensate is normally adjusted to a pH of 12 by the addition of NaOH before it is recycled through the TLP evaporator system. These vessels are equipped with pulse jet mixers and passive air inlet lines for hydrogen control during normal and abnormal operations and during and after design level seismic events as shown on the Process Flow Diagram. TLP-VSL-00002 receives decontaminated condensate from the three TLP system condensers which has little chemical content. This vessel is provided with a passive air inlet line for hydrogen control, but is not equipped with pulse jet mixers. The vessels are furnished with grounding lugs to control the discharge of static electricity as shown on the drawings. All vessels are equipped with internal spray rings for decontamination.
Waste Characteristics	Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	Vessel/Tank Material Selection Data Sheets, Mechanical Data Sheets and System Description listed above under References	The Vessel/Tank Material Selection Data Sheet shows that the material selected for TLP-VSL-00009A & B takes into account the reagents added to the waste received in the tank. The material selected for the tanks primary containment boundary is UNS N08367, a 6% Mo stainless steel. 304 stainless steel (maximum 0.030% Carbon), dual certified is specified for the support skirt for the tank. This material is hereinafter described as 304L stainless steel. The Vessel/Tank Material Selection Data Sheet for TLP-VSL-00002 shows that 304L stainless steel was selected for the primary containment boundary for this vessel.

**Pretreatment Facility (PTF) Treated LAW Evaporation Process (TLP) System  
Vessels TLP-VSL-00002 and TLP-VSL-00009A&B**

COGEMA-IA-048, Rev. 0

Information Assessed		Source of Information	Discussion
<b>Waste Characteristics</b>	The waste types are compatible with each other.	System Description listed above under References	The TLP System Description document identifies that the primary liquids used in vessels TLP-VSL-00009A&B are LAW SBS condensates and other dilute wastes generated in LAW operations. When received, these waste are adjusted to pH 12 so they can be recycled through the TLP evaporator system. TLP-VSL-00002 receives decontaminated TLP system condensate which is also compatible with the TLP system waste feed. These wastes are compatible. No other wastes are used in these vessels.
<b>Compatibility</b>	Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)	Vessel/Tank Material Selection Data Sheets, Mechanical Data Sheets and System Description listed above under References	The Vessel/Tank Material Selection Data Sheet shows that the material selected for TLP-VSL-00009A & B takes into account the acidic nature of the LAW SBS condensate received from the LAW facility and the reagents added to the waste received in the tank. The material selected for the tanks is UNS N08367, a 6% Mo stainless steel. The Vessel/Tank Material Selection Data Sheet for TLP-VSL-00002 shows that 304L stainless steel was selected for this vessel. These material selections are correctly carried forward to the vessels Mechanical Data Sheets. The materials selected are adequate to provide the required 40 year service life for these vessels.
<b>Corrosion Allowance</b>	Corrosion allowance is adequate for the intended service life of the vessel.	Vessel/Tank Material Selection Data Sheets, Drawings and Mechanical Data Sheets listed above under References	The Vessel/Tank Material Selection Data Sheet for TLP-VSL-00009A&B specifies a corrosion allowance of 0.040 inches for a 40 year design life based on selection of UNS N08367 (6% Mo) stainless steel for use in this waste environment. The Vessel/Tank Material Selection Data Sheet for TLP-VSL-00002 shows that 304L stainless steel was selected for this vessel with a corrosion allowance of 0.040 in. for a 40 year design life. These material selections and corrosion allowances assure an adequate service life for the vessels.
<b>Pressure Controls</b>	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.	Drawings listed above under References	The Process Flow Diagram shows that vessels TLP-VSL-00002 and TLP-VSL-00009A&B overflow to vessel PWD-VSL-00033 located at elevation (-) 45' -0" in the PTF. The Equipment Assembly drawings show that the overflow lines are larger than any of the other liquid conveying lines entering the vessels and therefore have adequate flow capacity to preclude overpressure.